

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
8 January 2004 (08.01.2004)

PCT

(10) International Publication Number
WO 2004/003269 A1

(51) International Patent Classification⁷:
D01F 6/74, C08J 5/18 // C08L 79:04

D01D 10/02,

(74) Agent: HEIMANN, Annette; CPW GMBH, Kasinos-
trasse 19-21, 42103 Wuppertal (DE).

(21) International Application Number:

PCT/EP2003/006578

(22) International Filing Date: 23 June 2003 (23.06.2003)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:
02014303.8

27 June 2002 (27.06.2002) EP

(71) Applicant (for all designated States except US): TEIJIN
TWARON B.V. [NL/NL]; Westervoortsedijk 73, NL-6827
AV Arnhem (NL).

(72) Inventor; and

(75) Inventor/Applicant (for US only): ZEGERS, Hendrikus,
Cornelis [NL/NL]; Vleugelstraat 13, NL-6922 JM Duiven
(NL).

(81) Designated States (national): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,
CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,
LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,
MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE,
SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ,
VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,
ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO,
SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM,
GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.

(54) Title: PROCESS FOR OBTAINING A SYNTHETIC ORGANIC AROMATIC HETEROCYCLIC ROD FIBER OR FILM
WITH HIGH TENSILE STRENGTH AND/OR MODULUS

(57) Abstract: The invention pertains to a process for obtaining a synthetic organic aromatic heterocyclic rod fiber or film with high
tensile strength and/or modulus comprising spinning a synthetic organic polymer to a aromatic heterocyclic rod fiber or obtaining the
synthetic organic polymer as an aromatic heterocyclic rod film, followed by loading the fiber or film in the presence of a processing
aid, at a temperature below the boiling point of the processing aid and above -50° C, at a tension of 10 to 95 % of the fiber or film
breaking strength, followed by removing the processing aid and/or performing a heating step at a tension of 10 to 95% of the fiber
or film breaking strength.

WO 2004/003269 A1

INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP 03/06578

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 D01D10/02 D01F6/74 C08J5/18
//C08L79:04

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 D01D D01F C08J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 94 25506 A (AKZO NOBEL NV ;SIKKEMA DOETZE JAKOB (NL); LISHINSKY VADIM LEONIDOV) 10 November 1994 (1994-11-10) the whole document & EP 0 696 297 A 14 February 1996 (1996-02-14) cited in the application	1-11
A	EP 0 384 425 A (E.I. DU PONT DE NEMOURS AND COMPANY) 29 August 1990 (1990-08-29) the whole document	1-7
A	PATENT ABSTRACTS OF JAPAN vol. 009, no. 228 (C-303), 13 September 1985 (1985-09-13) & JP 60 088117 A (ASAHI KASEI KOGYO KK), 17 May 1985 (1985-05-17) abstract	1-7

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the International filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *G* document member of the same patent family

Date of the actual completion of the international search

19 September 2003

Date of mailing of the international search report

02/10/2003

Name and mailing address of the ISA
European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Tarrida Torrell, J.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 03/06578

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9425506	A	10-11-1994	AT 169317 T	15-08-1998
			CA 2161663 A1	10-11-1994
			CN 1121728 A ,B	01-05-1996
			DE 69412250 D1	10-09-1998
			DE 69412250 T2	11-02-1999
			DK 696297 T3	10-05-1999
			WO 9425506 A1	10-11-1994
			EP 0696297 A1	14-02-1996
			ES 2120042 T3	16-10-1998
			JP 8509516 T	08-10-1996
			US 5674969 A	07-10-1997
			ZA 9402967 A	19-01-1995
EP 0696297	A	14-02-1996	DE 69412250 D1	10-09-1998
			DE 69412250 T2	11-02-1999
			DK 696297 T3	10-05-1999
			EP 0696297 A1	14-02-1996
			JP 8509516 T	08-10-1996
			US 5674969 A	07-10-1997
			AT 169317 T	15-08-1998
			CA 2161663 A1	10-11-1994
			CN 1121728 A ,B	01-05-1996
			WO 9425506 A1	10-11-1994
			ES 2120042 T3	16-10-1998
			ZA 9402967 A	19-01-1995
EP 0384425	A	29-08-1990	US 4985193 A	15-01-1991
			BR 9000765 A	22-01-1991
			CA 2009526 A1	21-08-1990
			CN 1045283 A	12-09-1990
			DE 69024074 D1	25-01-1996
			DE 69024074 T2	04-07-1996
			EP 0384425 A2	29-08-1990
			JP 2242914 A	27-09-1990
			JP 2893638 B2	24-05-1999
			KR 9710718 B1	30-06-1997
JP 60088117	A	17-05-1985	NONE	